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Has mental health harnessed the digital revolution?

In their editorial, Hollis *et al*[1] focus on the third of three digital revolutions – access to real-time patient data ('connected health') – but also highlight the benefits of the first two revolutions – unlocking value in electronic medical records and new forms of access that allow patients direct control.

How far have the first two digital revolutions embedded benefits for patient care in mental health? The first revolution (word-processing, from the 1960s) allowed people with little training to prepare, edit and duplicate high-quality documents. The second comes with the internet: ability to access, transmit, share and edit these documents. From these two revolutions, what can patients (and carers and professionals) expect as the outputs of the mental health IT system?

A basic expectation is that, before every face to-face clinical encounter, the IT system can easily deliver an accurate background history, account of recent treatment, and up-to-date care plan. (This list could be extended to include a summary history, complete history, and non-stigmatising vulnerability and risk history.) The safety of these documents is assured by accessibility (so that they are used and reviewed often) and accuracy (confirmed by patients and carers). They must be easily readable, to be safely understood, and actually used (as unread documents do not convey information).

The quality of these 'output' documents must convey respect for patients, carers and professionals and the interactions between them. For patients and carers, documents summarising core parts of their present or past lives must carry real-world acceptability in appearance and structure. Clinical staff able to take pride in their documentation (being clear, respectful, accurate and useful) will welcome sharing them with patients, carers and other professionals. Finally (as in the ordinary world) the IT system should save time for professionals (and patients and carers), freeing up treatment time.

Simple IT technology can deliver this for professionals, patients and carers. Hollis *et al*[1] note that mental health patients' use of technology is similar to the general UK population, with three-quarters of adults accessing the internet daily, half via a smart phone. I have only anecdotal knowledge of how far mental health IT is delivering the benefits of the first two revolutions.

Hollis *et al*[1] summarise key challenges for the third revolution in connected health:

> 'first, ensuring that patients and their needs remain at the centre of technology development and implementation; second, rapidly increasing the evidence base for the clinical effectiveness of digital technology; third, ensuring that the opportunity provided by data sharing between patients, carers and clinicians does not threaten privacy and undermine public trust. Finally, patients, clinicians and NHS commissioners require an agreed framework to evaluate the core features of new technologies including usability, content, safety, clinical- and cost-effectiveness'.

These still apply with equal force to the first two digital revolutions.

1 Hollis C, Morriss R, Martin J, Amani S, Cotton R, Denis M, et al. Technological innovations in mental healthcare: harnessing the digital revolution. *Br J Psychiatry* 2015; **206**: 263–5.

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Selective reporting of results in guidelines

Taylor and Perera[1] argue persuasively that the 2014 National Institute for Health and Care Excellence (NICE) schizophrenia guideline[2] promotes cognitive–behavioural therapy (CBT) and other psychosocial interventions beyond the evidence. Its conclusions with respect to CBT also seem open to another charge, that of selective reporting: the highlighting of favourable results while unfavourable ones are suppressed.[3]

In its clinical evidence summary (p. 232), NICE states that 'when compared with standard care, CBT was effective in reducing rehospitalisation rates up to 18 months following the end of treatment'. NICE actually examined rehospitalisation rates in three of the large series (more than 100) of meta-analyses they carried out (data available at www.nccmh.org.uk). One of these compared CBT with standard care at up to 18 months and found a significant effect (5 trials, 910 patients, relative risk (RR) 0.76, 95% CI 0.61–0.94). Another compared CBT with standard care at 2–4 years and failed to find a significant advantage (2 trials, 513 patients, RR 0.82, 95% CI 0.64–1.05). The third meta-analysis compared CBT with 'other active treatments' (which consisted in all but one case of putatively inactive control interventions such as befriending and supportive counselling) at up to 2 years; this was again non-significant (5 trials, 506 patients, RR 1.07, 95% CI 0.86–1.33). The findings of the two negative meta-analyses are not mentioned in the NICE guideline. Neither does NICE mention that CBT was not found to be effective against relapse when compared with either standard care (3 trials, 460 patients, RR 0.85, 95% CI 0.50–1.41) or other active treatments (4 trials, 416 patients, RR 1.05, 95% CI 0.85–1.30). This omission is difficult to understand given the obvious relationship between relapse and rehospitalisation.

NICE goes on to state that 'CBT was shown to be effective in reducing symptom severity as measured by total scores on items, such as the PANSS and BPRS, both at end of treatment and at up to 12 months' follow-up'. This was the case in the comparison between CBT and standard care, where there was a significant effect for CBT at the end of treatment (13 trials, 1356 patients, standardised mean difference (SMD) −0.27, 95% CI −0.45 to −0.10), as well as in meta-analyses of 6- and 12-month follow-up data. However, the findings were non-significant in the comparisons between CBT and 'other active treatments' both at end of treatment (6 trials, 396 patients, SMD −0.13, 95% CI −0.32 to 0.07) and at all follow-up points. Once again, NICE conveys an impression of uniform evidence of effectiveness against symptoms, whereas the reality is that an entire subset of pre-planned meta-analyses gave negative results.

Selective reporting arises when authors fail to publish data altogether, or when they arbitrarily decide which analyses and results to report in a publication. The NICE 2014 recommendations

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for CBT seem to be an example of the latter practice being applied to the results of multiple meta-analyses.

1 Taylor M, Perera U. NICE CG178 *Psychosis and Schizophrenia in Adults: Treatment and Management* – an evidence-based guideline? *Br J Psychiatry* 2015; **206**: 357–9.

2 National Institute for Health and Care Excellence. *Psychosis and Schizophrenia in Adults: Treatment and Management (CG 178)*. NICE, 2014.

3 Chan AW. Bias, spin, and misreporting: time for full access to trial protocols and results. *PLoS Med* 2008; **5**: e230.

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Authors' reply: We thank Dr McKenna (and colleagues) for his interest in our editorial, and respect his long record of research into schizophrenia. His point about the authors of influential national clinical guidelines such as NICE, the British Association for Psychopharmacology (BAP) and the Scottish Intercollegiate Guidelines Network (SIGN) needing to take negative evidence into account is well made, and analogous to the AllTrials movement in pharmacotherapeutics. Schizophrenia is such a common and potentially devastating illness that it is incumbent on mental health professionals such as psychologists and psychiatrists to work together to deliver best-evidenced treatments.

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Does previous experience of antidepressants form the expectations necessary for a placebo response?

Leuchter *et al*'s[1] findings extend the current understanding of the placebo response and raise important questions regarding the design of antidepressant trials. An important finding was that expectation of medication effectiveness predicted treatment response in the placebo group only, which suggests that expectations of treatment benefit are required for a placebo response.

It is thought that the placebo response results from an interaction between expectations and learning.[2] In studies of placebo analgesia, experimental paradigms often involve a conditioning procedure to induce an expectation of benefit from treatment. One widely used paradigm involves thermal pain stimulation and application of an inert cream. Following application of the cream, the thermal energy is reduced to non-painful levels to condition the participant to believe the cream has analgesic properties. Subsequently, laser stimulation continues at painful levels, and participants report the stimulation as less painful.[3–6] The implication is that an expectation of analgesia, induced by exposure to the cream's 'analgesic' properties, results in a placebo response.[3] Learning to expect an effect has also been shown to influence emotional processing. Petrovic *et al*[7] measured responses to aversive pictures in healthy volunteers following administration of placebo 'anxiolytic' medication and its reversal, and found that participants reported aversive pictures as less distressing when they thought they had received anxiolytic medication, and more distressing when they believed this had been reversed. This result shows that a learned expectation, induced through exposure to a medication, can cause changes in emotional processing.

In the study reported by Leuchter *et al*,[1] there was a relationship between expectation of benefit and treatment response in the placebo group. However, these patients did not undergo a conditioning procedure to induce an expectation of benefit. What caused these patients to expect a benefit? Could the therapeutic environment and consent process for starting an antidepressant engender a powerful expectation of benefit on its own? Or does this expectation come from previous experience of benefit from antidepressant treatment? The data from this study suggest the latter, as the expectations seemed to be formed at the time of enrolment. We could perhaps answer this question more fully through assessment of the relationship between previous response to antidepressant treatment and placebo response in this trial. It is possible that more patients in the placebo group had previously benefitted from treatment than in the medication group, and if this were so, it would lend support to the idea that previous experience of benefit from antidepressant treatment could cause a placebo antidepressant response. This could be an important consideration in future antidepressant drug trials.

1 Leuchter AF, Hunter AM, Tartter M, Cook IA. Role of pill-taking, expectation and therapeutic alliance in the placebo response in clinical trials for major depression. *Br J Psychiatry* 2014; **205**: 443–9.

2 Benedetti F, Carlino E, Pollo A. How placebos change the patient's brain. *Neuropsychopharmacology* 2011; **36**: 339–54.

3 Price DD, Milling LS, Kirsch I, Duff A, Montgomery GH, Nicholls SS. An analysis of factors that contribute to the magnitude of placebo analgesia in an experimental paradigm. *Pain* 1999; **83**: 147–56.

4 Morton DL, Brown CA, Watson A, El-Deredy W, Jones AKP. Cognitive changes as a result of a single exposure to placebo. *Neuropsychologia* 2010; **48**: 1958–64.

5 Huneke NTM, Brown CA, Burford E, Watson A, Trujillo-Barreto NJ, El-Deredy W, et al. Experimental placebo analgesia changes resting-state alpha oscillations. *PLoS One* 2013; **8**: e78278.

6 Watson A, El-Deredy W, Vogt BA, Jones AKP. Placebo analgesia is not due to compliance or habituation: EEG and behavioural evidence. *Neuroreport* 2007; **18**: 771–5.

7 Petrovic P, Dietrich T, Fransson P, Andersson J, Carlsson K, Ingvar M. Placebo in emotional processing–induced expectations of anxiety relief activate a generalized modulatory network. *Neuron* 2005; **46**: 957–69.

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Authors' reply: Huneke & Baldwin raise important points regarding the interpretation of our study results and the relationship of our findings to the broader placebo literature. It is challenging to compare the results from our study with the literature cited by them. As they note, studies of placebo analgesia generally are performed in healthy volunteers not being treated for a chronic illness. Such studies examine the placebo effect, namely the relief of transient, experimentally induced symptoms during manipulation of expectations. By contrast, our study examined placebo response, which involves relief of naturally occurring symptoms of a chronic illness (in this case major depressive disorder, or MDD) within the context of a clinical trial. Because patients with MDD have long courses of illness and treatment, they commonly enter treatment studies with pre-existing expectations and beliefs, and our participants had indeed formed expectations about medications at the time of study enrolment. We concluded that these expectations were probably formed by factors external to the study, and speculated on the role that